



Presenilins in Alzheimer's Disease and Frontotemporal Dementia

Citation

Shen, Jie. 2012. Presenilins in Alzheimer's disease and frontotemporal dementia. *Molecular Neurodegeneration* 7(Suppl 1): L8.

Published Version

doi:10.1186/1750-1326-7-S1-L8

Permanent link

<http://nrs.harvard.edu/urn-3:HUL.InstRepos:9527536>

Terms of Use

This article was downloaded from Harvard University's DASH repository, and is made available under the terms and conditions applicable to Other Posted Material, as set forth at <http://nrs.harvard.edu/urn-3:HUL.InstRepos:dash.current.terms-of-use#LAA>

Share Your Story

The Harvard community has made this article openly available.
Please share how this access benefits you. [Submit a story](#).

[Accessibility](#)

LECTURE PRESENTATION

Open Access

Presenilins in Alzheimer's disease and frontotemporal dementia

Jie Shen

From 2011 International Conference on Molecular Neurodegeneration
Shanghai, China. 22-24 September 2011

Background

Synaptic dysfunction is widely thought to be an important pathogenic event in Alzheimer's disease (AD). Presenilins, which harbor large numbers of mutations for familial AD and frontotemporal dementia (FTD), are important for neurotransmitter release and synaptic plasticity as well as memory and age-related neuronal survival.

Results

Our recent report showed that presenilins regulate synaptic function by modulating ryanodine receptor-mediated calcium release from the ER. To determine how presenilins regulate intracellular calcium signaling in neurons, we performed Ca^{2+} imaging coupled with electrophysiological and molecular analyses using both acute hippocampal slices of unique *presenilin* conditional mutant mice and cultured hippocampal neurons, in which presenilins are acutely inactivated with a lentivirus expressing Cre recombinase.

Conclusion

Our results reveal a selective interaction between presenilins and ryanodine receptors in the regulation of calcium homeostasis and synaptic function, and suggest that disruption of calcium homeostasis may be an early pathogenic event leading to synaptic dysfunction in AD. We also generated two *presenilin-1* knockin mice, in which either an AD- (L435F) or FTD (G183V) -causing mutation is introduced into the respective *presenilin-1* endogenous genomic locus, to investigate the mechanisms by which presenilin mutations cause AD or FTD. The analysis of these mutant mice will also be presented.

Published: 7 February 2012

Center for Neurologic Diseases, Program in Neuroscience, Harvard Medical School, Boston, Massachusetts, USA

doi:10.1186/1750-1326-7-S1-L8

Cite this article as: Shen: Presenilins in Alzheimer's disease and frontotemporal dementia. *Molecular Neurodegeneration* 2012 **7**(Suppl 1):L8.

Submit your next manuscript to BioMed Central and take full advantage of:

- Convenient online submission
- Thorough peer review
- No space constraints or color figure charges
- Immediate publication on acceptance
- Inclusion in PubMed, CAS, Scopus and Google Scholar
- Research which is freely available for redistribution

Submit your manuscript at
www.biomedcentral.com/submit

